

REMARKS

Further to the Applicant's RCE filed on even date and in reply to the Final Office Action (Paper No. 14) mailed June 19, 2003, Applicants assert that the claims are patentable in view of the following remarks and intend to further submit factual evidence by way of a Declaration to support Applicants' arguments.

As per claims 1 to 9, as originally filed, where the liquidus temperature is lower than 230°C, the copper dissolution rate is lower than 0.15 $\mu\text{m}/\text{sec}$. The viscosity is lower than 2.5 cP. This exhibits the advantages of the subject lead-free solder with regard to the title of Table 4 on page 19 of the specification it is found from Table 4 that the liquidus temperature is minimized when the Ag content is 3.5 wt.% and the Cu content is 0.8 wt.% and that the liquidus temperature rises if the Ag content is increased or decreased from 3.5 wt.% and the Cu content is increased or decreased from 0.8 wt.%.

Claims 1-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, as being obvious (35 U.S.C. § 103(a)) over WO9834755 with argument that this reference discloses a Pb-free Sn-based solder composition with lower limits about the same as the claimed upper limits of Ag and Cu in the rejected claims. The rejection is believed to be improper because the Examiner does not heed the clear showing in the specification of the criticality of containing the Ni content in the range of 0.02 wt.% to 0.06 wt.%. This is explained in the specification on page 21, lines 11-21 where it is noted that when the Ni content is less than 0.02 wt.%, the suppression of the "copper leaching" is insufficient. On the other hand, as also explained there, when the Ni content is greater than 0.06 wt.%, the liquidus temperature is excessively high,

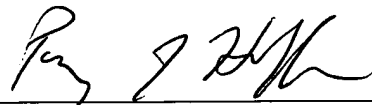
causing a danger that some defect may occur in the PWB and/or electronic components. Likewise, it is explained on page 22, lines 3-20, that when the Fe content is less than 0.02 wt.%, the suppression of the "copper leaching" is insufficient and that if the Fe content is greater than 0.06 wt.%, the viscosity is excessively high, causing problems with the uniformity of the thickness of the coated solder on the copper circuit layers of the PWB when the solder is coated by the hot-air leveling method.

Also, it is found from Table 4 that the liquidus temperature is relatively lower when the Cu content is in the range from 0.4 wt.% to 1.2 wt.%. The liquidus temperature is relatively lower when the Ag content is in the range from 1 wt.% to 4 wt.%. On the other hand, it is found from Table 5 that the copper dissolution rate increases as the Cu and Ag contents are increased, which teach away from the present invention, as claimed.

This application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

Dated: 10-20-03



Perry J. Hoffman, Registration No. 37,150
MICHAEL BEST & FRIEDRICH LLC
ATTORNEYS AT LAW
401 North Michigan Avenue
Chicago, Illinois 60611
Telephone 312-661-2100; Fax 312-661-0029